

What is Claimed is:

1. A flat type fluorescent lamp comprising:
an outer lamp body sealed to define a discharge space; and
tube spacers installed in the outer lamp body to divide the discharge space
5 and thereby to define a discharge path.
2. A flat type fluorescent lamp of claim 1 wherein the outer lamp body
comprises a front panel, a rear panel, and circumference seal members formed of
tube spacers or flat side plates.
3. A flat type fluorescent lamp of claim 1 wherein the tube spacers have a
10 section formed in one of a circular-shape, an oval-shape and a polygon-shape.
4. A flat type fluorescent lamp of claim 1 wherein the tube spacers are
alternately arranged with each other and formed shorter than a width of the outer
lamp body, thereby forming the discharge path in a zigzag-shape between one
ends of the tube spacers and one circumferential seal member.
- 15 5. A flat type fluorescent lamp of claim 1 wherein the tube spacers are
alternately arranged in parallel and extending from one side to the other side of the
circumferential seal members opposing each other, through holes are being
formed in the vicinity of one end of each of the tube spacers to define the
discharge path.
- 20 6. A flat type fluorescent lamp of claim 1 wherein the tube spacer is further
provided with plural discharge holes or a slot-shaped discharge hole.
7. A flat type fluorescent lamp of claim 1 wherein a length of the tube
spacer is shorter than a width of the outer lamp body, the tube spacers are aligned

in lines or randomly distributed.

8. A flat type fluorescent lamp of claim 1 wherein a phosphor layer is deposited on the outer or/and inner surfaces of the outer lamp body and the tube spacers.

5 9. A flat type fluorescent lamp of claim 8 wherein a thickness "d" of the phosphor layer is determined to satisfy the following range:

$$d = 4 \log_e W \sim d = 4 \log_e W + 16 \quad (\text{where } W \text{ is electric power of the lamp}).$$

10 10. A flat type fluorescent lamp of claim 8 wherein the phosphor layer is deposited by using exiting luminescent phosphors with ultraviolet rays.

10 11. A flat type fluorescent lamp of claim 8 wherein the phosphor layer deposited on the front panel and the phosphor layer deposited on the rear panel of the outer lamp body are different in a thickness.

15 12. A flat type fluorescent lamp of claim 11 wherein the thickness of the phosphor layer deposited on the front panel is about 60-70% with respect to that deposited on the rear panel.

 13. A flat type fluorescent lamp of claim 8 wherein the phosphor layer is deposited only on an inner surface of the front panel of the outer lamp body.

 14. A flat type fluorescent lamp of claim 1 wherein the phosphor layer is deposited on an outer surface of the front panel of the outer lamp body.

20 15. A flat type fluorescent lamp of claim 14 wherein a transparent protecting layer is further deposited on the phosphor layer.

 16. A flat type fluorescent lamp of claim 1 wherein a phosphor layer unit is assembled on the front panel of the outer lamp body, the phosphor layer unit

comprises a transparent panel, a phosphor layer deposited on the transparent panel, and a transparent protecting layer deposited on the phosphor layer.

17. A flat type fluorescent lamp of claim 1 further comprising a discharge electrode supported on the outer lamp body.

5 18. A flat type fluorescent lamp of claim 17 wherein the discharge electrode is one of a cold cathode and a hot cathode.

19. A flat type fluorescent lamp of claim 1 further comprising a pair of discharge electrodes disposed opposing inner both sides of the outer lamp body, and the tube spacers are disposed to define a discharge path between the pair of
10 discharge electrodes.

20. A flat type fluorescent lamp of claim 19 wherein the discharge electrodes are formed of flat plates on surfaces of which grooves or projections are formed.

21. A flat type fluorescent lamp of claim 19 wherein the discharge
15 electrodes are selected from the group consisting of a hollow cathode, a micro hollow cathode, a nano-tube, a carbon nano-tube, a metal wire and a metal hollow wire.

22. A flat type fluorescent lamp of claim 19 wherein the discharge electrodes is coated on an inner surface of the outer lamp body.

20 23. A flat type fluorescent lamp of claim 19 wherein the discharge electrodes are formed of a material selected from the group consisting of diamond-like-carbon, amorphous-carbon, and boron nitride.